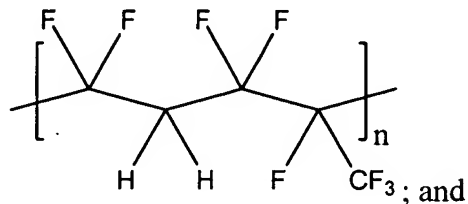


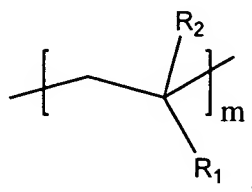
## CLAIMS

What is claimed is:

1. A block copolymer comprising a fluorinated block and at least one non-fluorinated block, wherein the fluorinated block has the following structure:



wherein the non-fluorinated block has the following structure:

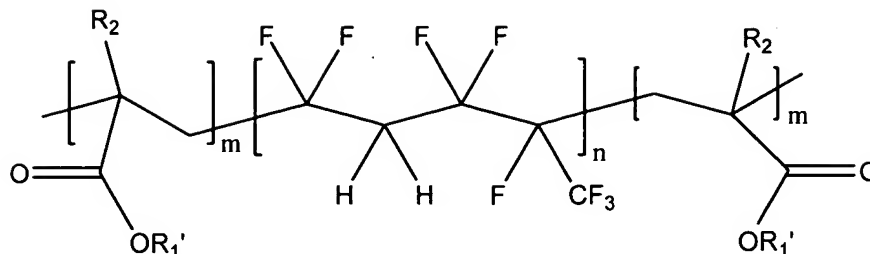


wherein  $\text{R}_1$  is selected from the group consisting of  $-\text{CH}_3$ ,  $-\text{CF}_3$ ,  $-\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$ , -phenyl, naphthyl,  $-\text{COOR}_3$ , and  $-\text{CONR}_3\text{R}_4$ ;

- 10 wherein  $\text{R}_2$  is selected from the group consisting of  $-\text{H}$ ,  $-\text{CH}_3$ ,  $-\text{CF}_3$ ,  $-\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$ , -phenyl, and naphthalenyl; and

wherein  $\text{R}_3$  and  $\text{R}_4$  are selected from the group consisting of  $-\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{OH}$ , and -PEG.

- 15 2. The block copolymer of claim 1 having a formula of the following structure:



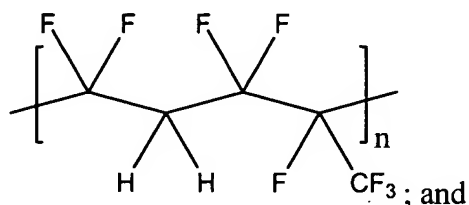
wherein  $R_1'$  is selected from the group consisting of  $-\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{OH}$ , and  $-\text{PEG}$ , and

wherein  $R_2$  is selected from the group consisting of  $-\text{H}$  or  $-\text{CH}_3$ ,  $-\text{CF}_3$ ,  $-\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{phenyl}$  and  $-\text{naphthyl}$ .

3. The block copolymer of claim 2 wherein  $R_1'$  is  $-\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{OH}$ , or  $-\text{PEG}$ , and

wherein  $R_2$  is  $-\text{H}$  or  $-\text{CH}_3$ .

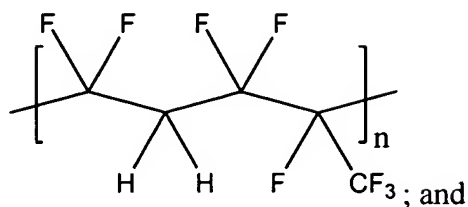
4. A block copolymer comprising a fluorinated block and at least one non-fluorinated block, wherein the fluorinated block has the following structure:



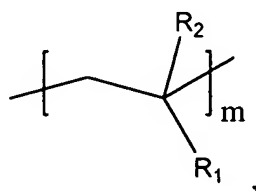
wherein the non-fluorinated block is a polymer selected from the group consisting of polyesters, polyethers, polyanhydrides, polyglycols, poly(alkylene oxides), polyhydroxyalkanoates, polyphosphazenes, polyurethanes, and a combination thereof.

5. A polymeric coating composition comprising a block copolymer which comprises a fluorinated block and at least one non-fluorinated block, wherein the

fluorinated block has the following structure:



wherein the non-fluorinated block has the following structure:

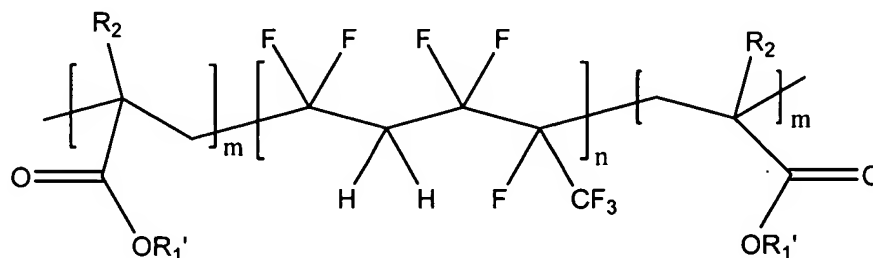


5        wherein  $R_1$  is selected from the group consisting of  $-\text{CH}_3$ ,  $-\text{CF}_3$ ,  $-\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$ , -phenyl, naphthyl,  $-\text{COOR}_3$ , and  $-\text{CONR}_3\text{R}_4$ ;

wherein  $R_2$  is selected from the group consisting of  $-\text{H}$ ,  $-\text{CH}_3$ ,  $-\text{CF}_3$ ,  $-\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$ , -phenyl, and naphthalenyl; and

wherein  $R_3$  and  $R_4$  are selected from the group consisting of  $-\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{OH}$ , and -PEG.

6.        The coating composition of claim 5 wherein the block copolymer has a formula of the following structure:



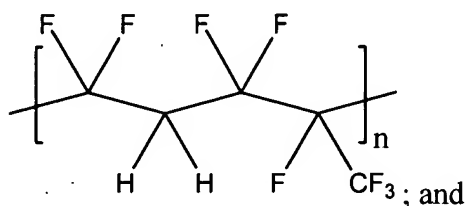
wherein  $R_1'$  is selected from the group consisting of  $-\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{OH}$ , and -PEG, and

wherein  $R_2$  is selected from the group consisting of  $-H$  or  $-CH_3$ ,  $-CF_3$ ,  $-CH_2CH_3$ ,  $-CH_2CH_2CH_3$ ,  $-CH_2CH_2CH_2CH_3$ ,  $-phenyl$  and  $naphthyl$ .

7. The coating composition of claim 6 wherein  $R_1$  is selected from the group consisting of  $-CH_3$ ,  $-CH_2CH_3$ ,  $-CH_2CH_2CH_3$ ,  $-CH_2CH_2CH_2CH_3$ ,  $-CH_2CH_2OH$ ,  
5 or  $-PEG$ , and

wherein  $R_2$  is  $-H$  or  $-CH_3$ .

8. A polymeric coating composition comprising a block copolymer which comprises a fluorinated block and at least one non-fluorinated block, wherein the fluorinated block has the following structure:



wherein the non-fluorinated block is a polymer selected from the group consisting of polyesters, polyethers, polyanhydrides, polyglycols, poly(alkylene oxides), polyhydroxyalkanoates, polyphosphazenes, polyurethanes, and a combination thereof.

- 15 9. The coating composition of claim 5 further comprising a bioactive agent.
10. The coating composition of claim 6 further comprising a bioactive agent.
11. The coating composition of claim 7 further comprising a bioactive  
20 agent.

12. The coating composition of claim 8 further comprising a bioactive agent.

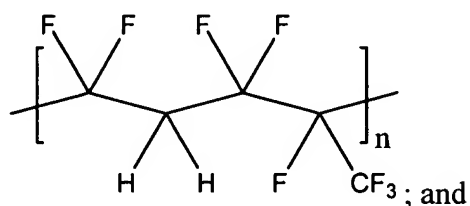
13. The coating composition of claim 9 wherein the bioactive agent is selected from the group consisting of tacrolimus, dexamethasone, rapamycin, Everolimus, 40-O-(3-hydroxy)propyl-rapamycin, 40-O-[2-(2-hydroxy)ethoxy]ethyl-rapamycin, and 40-O-tetrazole-rapamycin.

14. The coating composition of claim 10 wherein the bioactive agent is selected from the group consisting of tacrolimus, dexamethasone, rapamycin, Everolimus, 40-O-(3-hydroxy)propyl-rapamycin, 40-O-[2-(2-hydroxy)ethoxy]ethyl-rapamycin, and 40-O-tetrazole-rapamycin.

15. The coating composition of claim 11 wherein the bioactive agent is selected from the group consisting of tacrolimus, dexamethasone, rapamycin, Everolimus, 40-O-(3-hydroxy)propyl-rapamycin, 40-O-[2-(2-hydroxy)ethoxy]ethyl-rapamycin, and 40-O-tetrazole-rapamycin.

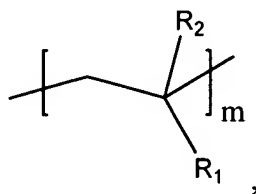
16. An implantable device comprising a coating which comprises a block copolymer, the block copolymer comprising a fluorinated block and at least one non-fluorinated block.

17. The implantable device of claim 16, wherein the fluorinated block has the following structure:



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wherein the non-fluorinated block has the following structure:

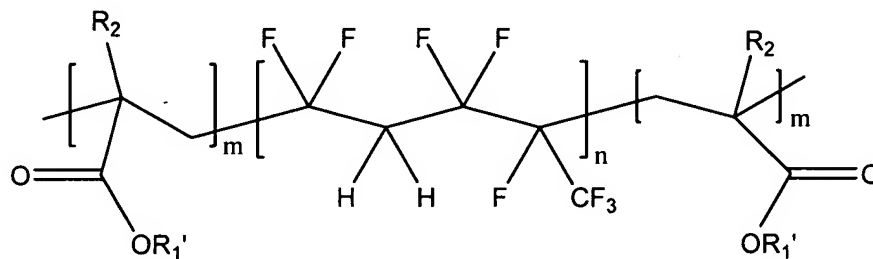


wherein  $R_1$  is selected from the group consisting of  $-\text{CH}_3$ ,  $-\text{CF}_3$ ,  $-\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$ , -phenyl, naphthyl,  $-\text{COOR}_3$ , and  $-\text{CONR}_3\text{R}_4$ ;

5 wherein  $R_2$  is selected from the group consisting of  $-\text{H}$ ,  $-\text{CH}_3$ ,  $-\text{CF}_3$ ,  $-\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$ , -phenyl, and naphthalenyl; and

wherein  $R_3$  and  $R_4$  are selected from the group consisting of  $-\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{OH}$ , and -PEG.

18. The implantable device of claim 17, wherein the block copolymer has a  
10 formula of the following structure:



wherein  $R_1'$  is selected from the group consisting of  $-\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{OH}$ , and -PEG, and

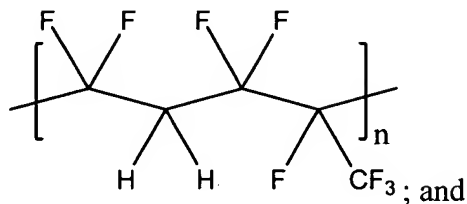
15 wherein  $R_2$  is selected from the group consisting of  $-\text{H}$  or  $-\text{CH}_3$ ,  $-\text{CF}_3$ ,  $-\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$ , -phenyl and naphthyl.

19. The implantable device of claim 18 wherein  $R_1'$  is selected from the group consisting of  $-\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$ ,  $-\text{CH}_2\text{CH}_2\text{OH}$ ,

or -PEG, and

wherein  $R_2$  is -H or -CH<sub>3</sub>.

20. The implantable device of claim 16, wherein the fluorinated block has the following structure:



wherein the non-fluorinated block is a polymer selected from the group consisting of polyesters, polyethers, polyanhydrides, polyglycols, poly(alkylene oxides), polyhydroxyalkanoates, polyphosphazenes, polyurethanes, and a combination thereof.

10 21. The implantable device of claim 16, which is a drug-eluting stent, wherein the coating further comprises a bioactive agent.

22. The implantable device of claim 17, which is a drug-eluting stent, wherein the coating further comprises a bioactive agent.

15 23. The implantable device of claim 18, which is a drug-eluting stent, wherein the coating further comprises a bioactive agent.

24. The implantable device of claim 19, which is a drug-eluting stent, wherein the coating further comprises a bioactive agent.

25. The implantable device of claim 20, which is a drug-eluting stent, wherein the coating further comprises a bioactive agent.

20 26. The implantable device of claim 21, wherein the bioactive agent is

selected from the group consisting of tacrolimus, dexamethasone, rapamycin, Everolimus, 40-O-(3-hydroxy)propyl-rapamycin, 40-O-[2-(2-hydroxy)ethoxy]ethyl-rapamycin, and 40-O-tetrazole-rapamycin.

27. The implantable device of claim 22, wherein the bioactive agent is  
5 selected from the group consisting of tacrolimus, dexamethasone, rapamycin, Everolimus, 40-O-(3-hydroxy)propyl-rapamycin, 40-O-[2-(2-hydroxy)ethoxy]ethyl-rapamycin, and 40-O-tetrazole-rapamycin.

28. The implantable device of claim 23, wherein the bioactive agent is  
selected from the group consisting of tacrolimus, dexamethasone, rapamycin,  
10 Everolimus, 40-O-(3-hydroxy)propyl-rapamycin, 40-O-[2-(2-hydroxy)ethoxy]ethyl-rapamycin, and 40-O-tetrazole-rapamycin.

29. The implantable device of claim 24, wherein the bioactive agent is  
selected from the group consisting of tacrolimus, dexamethasone, rapamycin,  
Everolimus, 40-O-(3-hydroxy)propyl-rapamycin, 40-O-[2-(2-hydroxy)ethoxy]ethyl-  
15 rapamycin, and 40-O-tetrazole-rapamycin.

30. The implantable device of claim 25, wherein the bioactive agent is  
selected from the group consisting of tacrolimus, dexamethasone, rapamycin,  
Everolimus, 40-O-(3-hydroxy)propyl-rapamycin, 40-O-[2-(2-hydroxy)ethoxy]ethyl-  
rapamycin, and 40-O-tetrazole-rapamycin.

20 31. A method of treating restenosis or vulnerable plaque, comprising  
implanting in a human being in need thereof the implantable device of claim 16.

32. A method of treating restenosis or vulnerable plaque, comprising



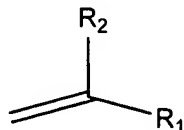
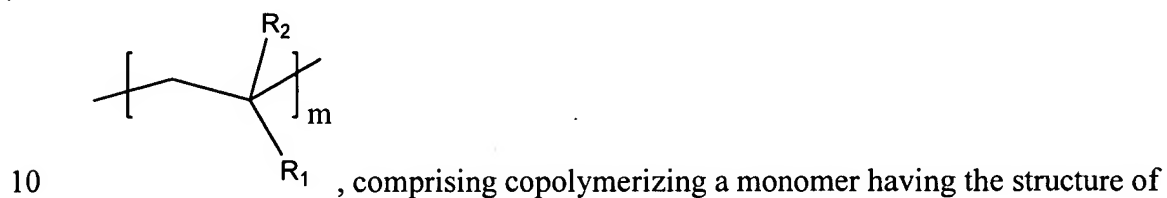
implanting in a human being in need thereof the implantable device of claim 17.

33. A method of treating restenosis or vulnerable plaque, comprising implanting in a human being in need thereof the implantable device of claim 26.

34. A method of treating restenosis or vulnerable plaque, comprising  
5 implanting in a human being in need thereof the implantable device of claim 27.

35. A method of treating restenosis or vulnerable plaque, comprising implanting in a human being in need thereof the implantable device of claim 28.

36. A method of synthesizing a block copolymer comprising a fluorinated block and at least a block of the following structure:



in the presence of a di-halo macromer,

wherein R<sub>1</sub> is selected from the group consisting of -CH<sub>3</sub>, -CF<sub>3</sub>, -CH<sub>2</sub>CH<sub>3</sub>, -CH<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub>, -CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub>, -phenyl, naphthyl, -COOR<sub>3</sub>, and -CONR<sub>3</sub>R<sub>4</sub>;

15 wherein R<sub>2</sub> is selected from the group consisting of -H, -CH<sub>3</sub>, -CF<sub>3</sub>, -CH<sub>2</sub>CH<sub>3</sub>, -CH<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub>, -CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub>, -phenyl, and naphthalenyl; and

wherein R<sub>3</sub> and R<sub>4</sub> are selected from the group consisting of -CH<sub>3</sub>, -CH<sub>2</sub>CH<sub>3</sub>, -CH<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub>, -CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub>, -CH<sub>2</sub>CH<sub>2</sub>OH, and -PEG, and

wherein the di-halo macromer is selected from the group consisting of di-chloro macromer, di-bromo macromer, di-iodo macromer and a combination thereof.

37. The method of claim 36 wherein the di-halo macromer is formed by polymerizing a fluorinated olefin in the presence of a dihalide.

5 38. The method of claim 37 wherein the fluorinated olefin is selected from the group consisting of vinylidene fluoride, hexafluoropropylene, tetrafluoroethylene, and a combination thereof.

39. The method of claim 38 wherein the di-halo macromer is prepared by polymerizing a mixture of vinylidene fluoride and 1,1,2,3,3,3-hexafluoropropylene in  
10 the presence of 1,2-diiodo-1,1,2,2-difluoroethylene.

40. The method of claim 39 the di-halo macromer has a structure of

